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Laser cooling of extended crystals and optical fibers

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Abstract

The equation obtained earlier by the authors from a starting model Hamiltonian for the thermal conductivity of solids under conditions of laser cooling has been converted to a form that contains on its right-hand side an expression for the load power and the removed power. Numerical and analytical solutions are presented for this equation under conditions far from saturation. They give the time-dependent temperature distribution inside a sample for laser cooling of optical fibers and extended crystals. © 2003 Optical Society of America.